REMARKS/ARGUMENTS

The pending claims were examined and reported in the Office Action. Claims 1-4 and 6 are rejected. Applicants previously cancelled claims 5 and 7. Applicants submit additional claim 8. Applicants submit that no new matter is added herein as additional claim 8 is supported at least at page 6, line 20 through page 7, line 8.

Applicants request reconsideration of the application in view of the following remarks

35 U.S.C. § 103(a)

A.   It is asserted in the Office Action that claims 1-4 and 6 are rejected under 35 U.S.C. § 103(a), as being unpatentable U. S. Patent No. 6,400,831 issued to Lee et al. ("Lee") in view of U.S. Patent 6,329,379 to Rodriguez ("Rodriguez"). For a claim to be obvious every limitation of that claim must be taught by at least one properly combined reference. Applicants respectfully traverse the aforementioned rejection for the following reasons.

> Lee discloses a method of manually segmenting without knowledge of color, shape or motion (see Lee, column 6, lines 7-10). Lee also teaches a method of forming boundaries for semantic objects identified based on user input. Lee teaches that forming these boundaries only considers color of the object, and position values of the user input (see col., 9, lines 39-42 and 60-65; col. 10, lines 17-19; col. 11, lines 1-5, 12-17; and 33-37).

Rodriguez teaches manually segmenting objects or local regions in an original image and in a reconstructed image, manually declaring which pairs of objects or segments correspond, and then a computer performing edge detection algorithms in the vicinity of the traced borders of the segmented regions of the two images to obtain more accurate image segmentation (see column 5, lines 47-56). However, Rodriguez requires that the user trace objects in both the original image and the reconstructed image, and logically link the corresponding objects in order to reduce the chance of incorporating unwanted features in one of the members of a given pair of segments from the two images (see column 5, lines 42-46 and lines 57 through column 6, line 18 and FIG. 3). Consequently the principle of operation of Rodriguez of requiring the user to trace the objects in the two images and provide a logical linkage between the objects does not allow or enable the reconstructed frame to be automatically segmented based on a brightness information

of the first frame, because it instead requires comparing a pair of user declared pairs of objects from the two frames.

however, neither Lee, Rodriguez, nor the combination teaches or enables Applicant's claim 1 limitations of:

a)   defining and primarily segmenting objects existing in a first frame of a video sequence semi-manually based on spatial information such that, if the <u>user designates manually a rough boundary line</u> of the object within the frame, <u>then</u> the object within the frame is <u>automatically segmented based on</u> the designation-related information, <u>a brightness information of the first frame</u> and a color information of the first frame; and

b)   automatically segmenting the objects defined and segmented the first frame in a second frame within a moving video sequence by performing object-tracking based on movement of the objects defined and segmented in the first frame.

Moreover, by defining and primarily segmenting objects existing in a first frame semi-manually such that, if the user designates manually a rough boundary line of the object, then the object within the frame is automatically segmented based on designation-related information, a brightness information and a color information of the first frame; and automatically segmenting the objects defined and segmented in the first frame in a second frame, as claimed, embodiments described in the specification, for example, without limitation thereto, provide <u>unexpected benefits</u> of: (1) providing a more efficient and accurate segmentation that overcomes automatic segmentation problems of segmentation capability being varied in accordance with a set threshold value, and overcomes manual segmentation problems of taking a considerable long time because every frame requires the user's direct work (see at least page 2, lines 1-17 of the application); (2) allowing scene changes (e.g. to a new I-frame) and newly appeared video objects to be identified in a subsequent frame so that the more efficient and accurate process noted above can be continued by returning to semi-manual user segmenting for scene changes (see at least page 7, lines 9-19 of the application); (3) reducing the time required for segmentation of the users endeavor and improving the correctness of the automatic video object segmentation in a second frame (see at least page 8, lines 9-16 of the application); (4) effectively combining automatic segmentation and manual segmentation so that video objects are more correctly segmented and the users endeavor and time can be reduced (see at least page 8, lines 17-27); and (5) providing the benefits above to improve the accuracy and efficiency of video

editing, creating and compositing, such as for an object-based video codec or the like (see at least page 9, line s1-3 of the application). However, neither Lee nor Rodriguez teaches or enables such benefits. For example, Rodriguez requires, but the inventive embodiments noted above provide the benefit of not requiring that a user trace similar objects in an original image <u>and a reconstructed image, and declare which pairs of objects correspond</u> in those images. Thus, the embodiments described in the specification are more efficient. Moreover, the inventive embodiments noted above provide the benefit of overcoming the problems of segmentation capability varied in accordance with a threshold value as required by Lee's inferior and less accurate system (e.g. see page 2, lines 1-4 of the current application and page 8, lines 20 through page 9, line 3).

Additionally, the claims that directly or indirectly depend on claim 1, namely claims 2-4 and 6, are also not unpatentable over Lee and Rodriguez for the same reasons.

In addition to being dependent upon allowable base claim 1, Applicants disagree with the rejection above of claim 2 for at least the reason that the cited references do not teach or enable determining whether any scene change is made between consecutive frames or any new object other than the primary segment object appears in the video sequence, then repeatedly automatically segmenting, as required by claim 2.

The Patent Office cites column 4, lines 11-17 which teach that global motion estimation is used to provide motion description for scene change from frame to frame, and is employed to track object motion during unsupervised processing. However, applicants traverse that this teaches or enables determining whether a scene change is made, as required by claim 2, and respectfully requests that the Patent Office provide a reference in support of that position in accordance with MPEP § 2144.03. Specifically, Applicants are unsure how unsupervised processing teaches determining whether a new I-frame has been encountered. In addition, Applicants traverse that FIG. 2 of Lee teaches repeatedly performing the first step of claim 1, if it is determined that a scene change is made or a new object appears, and respectfully request that the Patent Office provide a reference in support of that position in accordance with MPEP § 2144.03. Instead, Lee shows motion estimation unit 116 in a P-frame tracking portion 108 of the device which is separate form I-frame segmentation portion 100 of the device; and does not show that a motion estimation generates a rough outline of a boundary in a next video frame.

Hence, for this additional reason, Applicants respectfully request the Patent Office withdraw the rejection above of claim 2.

Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejections for claims 1-4 and 6 is respectfully requested.

B.   It is asserted in the Office Action that claims 1-2 and 4-6 are rejected under 35 U.S.C. § 103(a), as being unpatentable by U. S. Patent No. 6,738,100 issued to Hampapur et al. ("Hampapur"). Applicants respectfully traverse the aforementioned rejection for the following reasons.

Hampapur discloses a method of detecting scene changes by extracting chromatic differences from a pair of video frames based on the chromatic differences and a first threshold. Hampapur then extracts a structural difference and uses a second threshold to select key frames. These thresholds are user selectable. Hampapur describes that the second threshold is a determination of the structural difference between two frames based on edge content of images (see col. 7, lines 52-56; and col. 9, line 2 through col. 14, line 56). However, this is not related to and does not teach, or enable Applicant's claim 1 limitations of:

> a)   defining and primarily segmenting objects existing in a first frame of a video sequence semi-manually based on spatial information such that, if the user designates manually a rough boundary line of the object within the frame, then the object within the frame is automatically segmented based on the designation-related information, a brightness information of the first frame and a color information of the first frame; and

> b)   automatically segmenting the objects defined and segmented the first frame in a second frame within a moving video sequence by performing object-tracking based on movement of the objects defined and segmented in the first frame.

In addition, the background of Hamapur also describes representing video, such as for accurate retrieval and re-use, based on visual, audio and semantic content, such as to capture the look of the video, its sound, and its meaning (see col. 1, lines 25-37). Such representations can be stored in a database so that a user trying to access video from a collection can query the database to perform content-based search of the video collection to locate a specific video asset of interest (see col. 1, lines 40-44). However, this does not teach, disclose or suggest Applicant's amended claim 1 limitations of:

a)   defining and primarily <u>segmenting objects existing in a first frame of a</u> <u>video sequence semi-manually</u> based on spatial information such that, if the user designates manually a rough boundary line of the object within the frame, <u>then</u> the object within the frame is <u>automatically segmented based on</u> the designation-related information, <u>a brightness information of the first frame</u> and a color information of the first frame; and

b)   automatically segmenting the objects defined and segmented the first frame in a second frame within a moving video sequence by performing object-tracking based on movement of the objects defined and segmented in the first frame.

For example, Applicants traverse that because Hampapur teaches a system, as noted above, that "this would fairly suggest that <u>when the user selects</u> the segmented video, the system automatically retrieves the segmented video based on the user define, this show the segmentation of video object is semi-manually," and respectfully requests the Patent Office provide a reference in support of that position in accordance with MPEP § 2144.03. That is, there is no teaching or enablement in Hampapur of user segment selection input, use, or correspondence between a user selected segment and the automatic processing of Hampapur. Instead, as noted above, the principle operation and primary purpose of Hampapur of performing all of the processing automatically without user input teaches against user segment selection.

Since Hampapur does not teach, enable all of Applicant's amended claim 1 limitations, Applicants respectfully assert that the rejection above has not been adequately set forth relative to Hampapur.

In addition, applicants submit that Hampapur does not teach or enable any of the benefits of claim 1 noted above with respect to claim 1 being patentable over Lee in view of Rodriguez. Instead, Hampapur provide automatic segmenting which has the problems of providing a segmentation capability varied in accordance with the threshold value on which a determination is made between consecutive images (see at least page 2, lines 1-4 of the current application) but does not provide an effective combination of automatic segmentation and manual segmentation that make it possible for video objects to be correctly segmented and a users endeavor and time to be reduced, such as to provide superior and more efficient segmentation for video editing, creating and compositing, such as of object-based video codec (see at least page 8, line 21 through page 9, line 3 of the application).

Additionally, the claims that directly or indirectly depend on claim 1, namely claims 2, 4 and 6, are also not anticipated by Hampapur for the same reason.

In addition to being dependent upon base claim 1 Applicants disagree with the rejection above of claim 2 for at least the reason that Hampapur does not teach or suggest determining whether any scene change is made between consecutive frames or any new object appears within the video sequence, and repeatedly performing the first step of claim 1, if the answer is positive, as required by claim 2.

Hampapur describes detecting scene changes by using a separate scene detection software program that compares each pixel in a first frame to each pixel in a second frame and detects a scene change if the difference between the pixel information exceeds a predetermined threshold (see column 3, lines 32-49). However, the Patent Office has not identified and Applicant's unable to find any teaching or enablement in Hampapur of determining whether a scene change is made when repeating automatically segmenting objects, and <u>repeatedly semi-manually sequencing video if the answer is positive</u>, as required by claim 2. Hence, for this additional reason, Applicants respectfully request the Patent Office withdraw the rejection above.

Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejection above for claims 1-2, 4 and 6 is respectfully requested.

Hence, Applicants respectfully request that all of the rejections above be withdrawn.

C. <u>Additional Claim 8</u>

Applicants submit that additional claim 8 is patentable over the cited references for at least the reasons provided above in support of claim 1 as well as for the additional patentable limitations of claim 8.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record, and are in condition for allowance and such action is earnestly solicited at the earliest possible date. If the Examiner believes a telephone conference would be useful in moving the case forward, he is encouraged to contact the undersigned at (310) 207-3800.
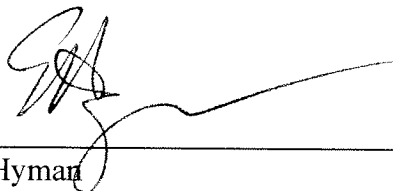
If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,
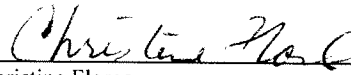
BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP

Dated: ___11/24/06___

Eric S. Hyman
Registration No. 30,139

1279 Oakmead Parkway
Sunnyvale, California 94085-4040
Telephone (310) 207-3800
Facsimile (408) 720-8383

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being submitted to the United States Patent and Trademark Office electronically via EFS Web on the date shown below.

Christine Flores   11/24/08
                                                          Date